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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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EXAMINER

CHEN, CHONGSHAN

ART UNIT	PAPER NUMBER
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2172

DATE MAILED: 10/21/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/784,392

Applicant(s)

PEDERSON ET AL.

Examiner

Chongshan Chen

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 28 July 2003.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-43 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-43 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____.
- 4) ☐ Interview Summary (PTO-413) Paper No(s). _____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other:

DETAILED ACTION

1. This action is responsive to communications: Amendment A, filed on 28 July 2003. This action is non-final.

Response to Arguments

2. Applicant's arguments with respect to claims 1-28 have been considered but are moot in view of the new ground(s) of rejection.

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. Claims 1-9 and 17-43 are rejected under 35 U.S.C. 103(a) as being unpatentable over Tada et al. ("Tada", 5,544,359) in view of Gautam et al. ("Gautam", 5,956,704).

As per claim 1, Tada teaches a method of performing a transaction in a database system, comprising:

receiving a transaction to be performed (Tada, col. 1, lines 23-27); and

performing a flush of a transaction log in each access module before an end transaction procedure (The applicants disclose "flush" as transferring the transaction log from the volatile storage to stable storage, specification, page 2, lines 13-20. Tada discloses "The log data is then

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transferred to the log data buffer (132) on the main storage unit (101)", Tada, Fig. 5, col. 10, lines 33-34).

Tada does not explicitly disclose the transaction is processed by a plurality of access modules. Gautam discloses the transaction is processed by a plurality of access modules (Gautam, col. 1, lines 26-43). Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to divide a large processing task into smaller work granules in the system of Tada. Because the smaller work granules can be distributed to processes running on one or more processing nodes, the processing required by the query can be completed much faster than if the processing was performed on a single node by a single process.

As per claim 2, Tada and Gautam teach all the claimed subject matters as discussed in claim 1, and further teach issuing a request to flush the transaction log with a message sent to each access module for performing a last step of the transaction, the last step performed prior to the end transaction procedure (Tada, Fig. 5, S14, Initialize transaction end indication).

As per claim 3, Tada and Gautam teach all the claimed subject matters as discussed in claim 2, and further teach performing the flush of the transaction log in a data access step prior to the end transaction procedure to avoid performance of a transaction log flush in the end transaction procedure (Tada, Fig. 5, S13, Write DB, S14, Initialize transaction end indication).

As per claim 4, Tada and Gautam teach all the claimed subject matters as discussed in claim 2, and further teach determining that the last step is being performed by all of the plurality of access modules (Tada, Fig. 5, col. 10, lines 35-37).

As per claim 5, Tada and Gautam teach all the claimed subject matters as discussed in claim 1, and further teach determining if the transaction log has been flushed before performing the end transaction procedure (Tada, Fig. 5, col. 10, lines 39-47).

As per claim 6, Tada and Gautam teach all the claimed subject matters as discussed in claim 5, and further teach avoiding performance of a transaction log flush in the end transaction procedure if the transaction log has been flushed (Tada, Fig. 5, col. 10, lines 29-47).

As per claim 7, Tada and Gautam teach all the claimed subject matters as discussed in claim 1, except for explicitly disclosing identifying the transaction as an implicit transaction. Implicit transaction is a type of SQL transaction which is used to access databases. The database management system of Tada performs transactions on a database (Tada, col. 1, lines 23-27). The database management system can use any available access method to access the database, which include implicit transaction.

As per claim 8, Tada and Gautam teach all the claimed subject matters as discussed in claim 1, and further teach performing the end transaction procedure, which follows execution of the transaction (Tada, Fig. 5, S14, Initialize transaction end indication).

As per claim 9, Tada and Gautam teach all the claimed subject matters as discussed in claim 8, and further teach skipping broadcast of a directive indicating commencement of the end transaction procedure to the plurality of access modules (Tada, Fig. 5, col. 10, line 10 – col. 11, line 64).

As per claim 17, Tada teaches a database system comprising:

a plurality of storage media (Tada, Fig. 1, elements 304, 305); and

the access module being adapted to flush a transaction log before performing an end transaction procedure (The applicants disclose “flush” as transferring the transaction log from the volatile storage to stable storage, specification, page 2, lines 13-20. Tada discloses “The log data is then transferred to the log data buffer (132) on the main storage unit (101)”, Tada, Fig. 5, col. 10, lines 33-34).

Tada does not explicitly disclose a plurality of access modules, wherein each access module is coupled to one of the plurality of storage media. Gautam discloses the transaction is processed by a plurality of access modules (Gautam, col. 1, lines 26-43). Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to divide a large processing task into smaller work granules in the system of Tada. Because the smaller work granules can be distributed to processes running on one or more processing nodes, the processing required by the query can be completed much faster than if the processing was performed on a single node by a single process.

As per claim 18, Tada and Gautam teach all the claimed subject matters as discussed in claim 17, and further teach determining if each access module has flushed the transaction log maintained by the access module (Tada, col. 10, lines 35-37).

As per claim 19, Tada and Gautam teach all the claimed subject matters as discussed in claim 18, and further teach skipping sending a directive to perform a transaction log flush if the controller determines that each access module has flushed the transaction log before the end transaction procedure (Tada, Fig. 5, col. 10, line 10 – col. 11, line 64).

As per claim 20, Tada and Gautam teach all the claimed subject matters as discussed in claim 17, and further teach providing a flush directive with a message to each of the access

modules to perform a last step of the transaction (Tada, Fig. 5, S12, Set transaction end indication).

As per claim 21, Tada teaches an article comprising a medium storing instructions for enabling a processor-based system to:

receive a transaction to be performed (Tada, col. 1, lines 23-27); and

determine that a last step of the transaction involves the plurality of access modules (Tada, Fig. 5, col. 10, lines 35-37); and

flush a transaction log to a storage while the last step is performed by the plurality of access modules (The applicants disclose “flush” as transferring the transaction log from the volatile storage to stable storage, specification, page 2, lines 13-20. Tada discloses “The log data is then transferred to the log data buffer (132) on the main storage unit (101)”, Tada, Fig. 5, col. 10, lines 33-34).

Tada does not explicitly disclose the transaction is processed by a plurality of access modules. Gautam discloses the transaction is processed by a plurality of access modules (Gautam, col. 1, lines 26-43). Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to divide a large processing task into smaller work granules in the system of Tada. Because the smaller work granules can be distributed to processes running on one or more processing nodes, the processing required by the query can be completed much faster than if the processing was performed on a single node by a single process.

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As per claim 22, Tada and Gautam teach all the claimed subject matters as discussed in claim 21, and further teach performing an end transaction, wherein the end transaction follows execution of the transaction (Tada, Fig. 5, S14, Initialize transaction end indication).

As per claim 23, Tada and Gautam teach all the claimed subject matters as discussed in claim 22, and further teach avoiding broadcast of a directive indicating commencement of the end transaction to the plurality of access modules (Tada, Fig. 5, col. 10, line 10 – col. 11, line 64).

As per claim 24, Tada teaches a method of performing a transaction in a database system, comprising:

maintaining a log to track operations performed in the transaction (Tada, col. 1, lines 23-27);

writing the log to persistent storage before start of an end transaction procedure (Tada, Fig. 5, col. 10, lines 33-34).

Tada does not explicitly disclose the transaction is processed by a plurality of access modules. Gautam discloses the transaction is processed by a plurality of access modules (Gautam, col. 1, lines 26-43). Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to divide a large processing task into smaller work granules in the system of Tada. Because the smaller work granules can be distributed to processes running on one or more processing nodes, the processing required by the query can be completed much faster than if the processing was performed on a single node by a single process.

As per claim 25, Tada and Gautam teach all the claimed subject matters as discussed in claim 24, and further teach writing the log to persistent storage comprises flushing the log (Tada, Fig. 5, col. 10, line 10 – col. 11, line 64).

As per claim 26, Tada and Gautam teach all the claimed subject matters as discussed in claim 24, and further teach maintaining a transaction log (Tada, Fig. 1, element 311).

As per claim 27, Tada and Gautam teach all the claimed subject matters as discussed in claim 24, and further teach performing the end transaction procedure, the end transaction procedure comprising writing an end transaction indication into the log (Tada, Fig. 5, S06, issue trn-end macro).

As per claim 28, Tada teaches a database system comprising:
storage media (Tada, Fig. 1, element 304, 305);
access modules coupled to the storage media (Tada, Fig. 3, element 106); and
providing a directive with a message to perform a last step of a transaction and
communicating the directive to the access modules, each access module responsive to the
directive to perform a transaction log flush before performance of an end transaction procedure
(Tada, Fig. 5, col. 10, line 10 – col. 11, line 64); and

determining if each of the access modules has performed a transaction log flush before
start of the end transaction procedure (Tada, Fig. 5, col. 10, lines 35-37);

avoiding sending a broadcast directive to the access modules to cause performance of a
transaction log flush during the end transaction procedure (Tada, Fig. 5, col. 10, line 10 – col. 11,
line 64).

Tada does not explicitly disclose a parsing engine. Gautam discloses the database management system divides the transaction into smaller work granules (Gautam, col. 1, lines 26-43). Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to include a parsing engine to divide a large processing task into smaller work granules in the system of Tada. Because the smaller work granules can be distributed to processes running on one or more processing nodes, the processing required by the query can be completed much faster than if the processing was performed on a single node by a single process.

As per claim 29, Tada and Gautam teach all the claimed subject matters as discussed in claim 1, and further teach performing the plural steps prior to performing the end transaction procedure (Tada, Fig. 5), and wherein performing the flush of the transaction log comprises performing the flush of the transaction log in one of the plural steps (Tada, Fig. 5, col. 10, line 10 – col. 11, line 64).

As per claim 30, Tada and Gautam teach all the claimed subject matters as discussed in claim 29, and further teach performing the flush of the transaction log in a last one of the plural steps (Tada, Fig. 5, S13, Write DB).

As per claim 31, Tada and Gautam teach all the claimed subject matters as discussed in claim 30, and further teach performing the flush of the transaction log in a last one of the plural steps (Tada, Fig. 5, S13, Write DB).

As per claim 32, Tada and Gautam teach all the claimed subject matters as discussed in claim 31, and further teach adding a first entry to the transaction log to redo the transaction by the access module in case of system failure (Tada, col. 3, lines 30-35).

As per claim 33, Tada and Gautam teach all the claimed subject matters as discussed in claim 4, and further teach performing the flush of the transaction log in the end transaction procedure if the last step is not performed by all of the plurality of access modules (Tada, Fig. 5, col. 10, line 10 – col. 11, line 64).

As per claim 34, Tada and Gautam teach all the claimed subject matters as discussed in claim 17, and further teach the access modules to perform a transaction comprising plural steps, one or more of the access modules adapted to perform the plural steps prior to the end transaction procedure, and the access modules adapted to perform the flush of the transaction log in one of the plural steps (Tada, Fig. 5, col. 10, line 10 – col. 11, line 64).

As per claim 35, Tada and Gautam teach all the claimed subject matters as discussed in claim 34, and further teach the one of the plural steps comprises a last one of the steps (Tada, Fig. 5, col. 10, line 10 – col. 11, line 64).

As per claim 36, Tada and Gautam teach all the claimed subject matters as discussed in claim 35, and further teach a first entry associated with each access module to enable a redo of the transaction in case of system failure (Tada, Fig. 1, col. 3, lines 30-35).

As per claim 37, Tada and Gautam teach all the claimed subject matters as discussed in claim 36, and further teach a second entry associated with each access module to enable an undo of the transaction (Tada, Fig. 1 & 5, col. 10, line 10 – col. 11, line 64).

As per claim 38, Tada and Gautam teach all the claimed subject matters as discussed in claim 34, and further teach determine whether a last one of the steps involves all the access modules, and in response to determining that the last one of the steps involves all the access

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modules, the controller to send a directive to all the access modules to perform the flush of the transaction log in the last one of the steps (Tada, Fig. 5, col. 10, line 10 – col. 11, line 64).

As per claim 39, Tada and Gautam teach all the claimed subject matters as discussed in claim 38, and further teach sending a directive to perform the flush of the transaction log in the end transaction procedure (Tada, Fig. 5, col. 10, line 10 – col. 11, line 64).

As per claim 40, Tada and Gautam teach all the claimed subject matters as discussed in claim 21, and further teach perform the plural steps prior to performing the end transaction procedure (Tada, Fig. 5), and wherein performing the flush of the transaction log comprises performing the flush of the transaction log in one of the plural steps (Tada, Fig. 5, col. 10, line 10 – col. 11, line 64).

As per claim 41, Tada and Gautam teach all the claimed subject matters as discussed in claim 40, and further teach wherein performing the plural steps comprises performing, in each of the plural steps, access of relational table data stored in the database system (Tada, col. 1, lines 23-27).

As per claim 42, Tada and Gautam teach all the claimed subject matters as discussed in claim 41, and further teach performing the flush of the transaction log in a last one of the plural steps (Tada, Fig. 5, col. 10, line 10 – col. 11, line 64).

As per claim 43, Tada and Gautam teach all the claimed subject matters as discussed in claim 42, and further teach enabling a processor-based system to cause each access module to add a first entry to the transaction log to redo the transaction by the access module in case of system failure (Tada, col. 3, lines 30-35).

5. Claims 10-16 are rejected under 35 U.S.C. 103(a) as being unpatentable over Tada et al. ("Tada", 5,544,359).

As per claim 1, Tada teaches a method of performing an end transaction procedure in a database system, comprising:

a first access module in the database system writing an end transaction indication to a first transaction log portion, the first access module being part of a cluster of access modules (Tada, Fig. 5, S12, Set Transaction End Indication); and

the first access module sending an end transaction directive to a module associated with the first access module (Tada, Fig. 5, S12, Set Transaction End Indication).

Tada does not explicitly disclose the module is a fallback module. Fallback is a redundancy operation in which a copy of a database portion is stored on a different access module than where the original of the data portion is stored. Tada teaches transferring data to buffer which is a different storage location than where the original of the data portion is stored (Tada, col. 10, lines 29-67). Therefore, it is obvious the system of Tada includes a fallback feature.

As per claim 11, Tada teaches all the claimed subject matters as discussed in claim 10, and further teaches the first access module sends the end transaction directive to the fallback module but not to other access modules in the cluster (Tada, Fig. 5, col. 10, line 10 – col. 11, line 64).

As per claim 12, Tada teaches all the claimed subject matters as discussed in claim 10, and further teaches sending the end transaction directive comprises sending an end transaction-part one directive (Tada, Fig. 5, col. 10, line 10 – col. 11, line 64).

As per claim 13, Tada teaches all the claimed subject matters as discussed in claim 12, and further teaches the first access module broadcasting an end transaction-part two directive to all access modules in the cluster (Tada, Fig. 5, col. 10, line 10 – col. 11, line 64).

As per claim 14, Tada teaches all the claimed subject matters as discussed in claim 10, and further teaches the fallback module writing an end transaction indication to a second transaction log portion (Tada, Fig. 5, col. 10, line 10 – col. 11, line 64).

As per claim 15, Tada teaches all the claimed subject matters as discussed in claim 10, and further teaches the first access module flushing the first transaction log portion (Tada, Fig. 5, col. 10, line 10 – col. 11, line 64).

As per claim 16, Tada teaches all the claimed subject matters as discussed in claim 10, and further teaches the first access module flushing the first transaction log portions but the other access modules in the cluster not flushing their respective transaction log portions (Tada, Fig. 5, col. 10, line 10 – col. 11, line 64).

Conclusion

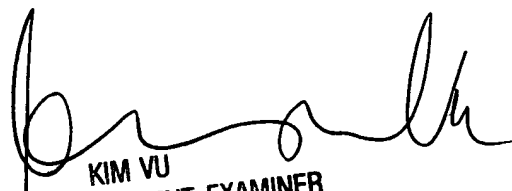
Any inquiry concerning this communication or earlier communications from the examiner should be directed to Chongshan Chen whose telephone number is 703-305-8319. The examiner can normally be reached on Monday - Friday (8:00 am - 4:30 pm).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Kim Y Vu can be reached on (703)305-4393. The fax phone number for the organization where this application or proceeding is assigned is (703) 872-9306.

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Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703)305-3900.

October 14, 2003


KIM VU
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 2100